

# International Journal of Research in Human Resource Management



E-ISSN: 2663-3361  
P-ISSN: 2663-3213  
IJRHRM 2023; 5(2): 111-115  
[www.humanresourcejournal.com](http://www.humanresourcejournal.com)  
Received: 08-08-2023  
Accepted: 17-09-2023

**Lyudmila Vladimirovna Krivko**  
Associate Professor,  
Department of Sociology of  
Medicine, Health Economics  
and Medical Insurance,  
Institute of Social Sciences,  
Sechenov University  
St. Trubetskaya, 8/2, Moscow,  
119992, Russian Federation

## The problem and contradictions of the reproduction of human capital in the Russian arctic

**Lyudmila Vladimirovna Krivko**

DOI: <https://doi.org/10.33545/26633213.2023.v5.i2b.154>

### Abstract

Based on the use of techniques of a systemic-institutional approach, the work identifies the “core” of contradictions in the regulation of human capital in the Russian Arctic region. National interests in the Russian Arctic are focused, first of all, on the economic efficiency of using natural resources. Analysis of socio-economic indicators of the development of the Arctic region revealed the risks of quantitative and qualitative impoverishment of the gene pool, social marginalization, reduction of time spent in working age and, as a consequence, the high cost of implementing state Arctic projects. Taking into account the influence of the geopolitical situation, resolution of contradictions is possible within the framework of the transition from evolutionary-progressive regulation to the dynamics of a “leap”. This transition is possible within the framework of the “soft management option” model, the subject of which should be leading enterprises in the mining and manufacturing industries.

**Keywords:** Human capital, healthcare, ecological situation, contradictions, arctic

### Introduction

The area of the Arctic zone of Russia is 4.8 million sq. km, the population in 2021 is 2.38 million people (about 50% of the population of the world Arctic). National state interests in the Arctic region are focused on economic and security issues. The tasks of improving the environmental situation, as well as replenishing the natural resource base, are not considered priorities. The expanded reproduction of human capital is not considered to be of primary interest as a strategic condition for the economic development of the Russian Arctic territories.

The purpose of the study is to substantiate the problems and contradictions of the reproduction of human capital in the Arctic region of modern Russia.

### Materials and Methods

The significance of the organizational role of the state in modern conditions is determined by the presence of a contradiction between the task of ensuring sustainable development and the maximum absorption of external resources by the socio-economic system. This contradiction is manifested in the evolutionary-progressive nature of state regulation of the processes of reproduction of human capital without taking into account the time lag of implemented management decisions.

The mechanism for realizing national state interests forms a polarized contradiction: the state serves as an exponent of national interests associated with the “costly” prospects for the economic, environmental, and social well-being of human capital carriers. At the same time, the state is interested in higher growth of the current economic efficiency of management decisions.

The “core” of the contradictions in state regulation of the reproduction of human capital in the Arctic region is formed by an imbalance of targets for the development of Arctic resources and the need for costly provision of expanded reproduction of human capital with a delayed economic effect.

As part of the analysis of the state of human capital in the Arctic region, we adhere to the position of A. Reshetnikov, who argues that “quantitative economic indicators are only auxiliary means for optimizing much more important indicators of social policy - the health of society and the health of nature” (Reshetnikov A., 2023) <sup>[15]</sup>.

**Corresponding Author:**  
**Lyudmila Vladimirovna Krivko**  
Associate Professor,  
Department of Sociology of  
Medicine, Health Economics  
and Medical Insurance,  
Institute of Social Sciences,  
Sechenov University  
St. Trubetskaya, 8/2, Moscow,  
119992, Russian Federation

A similar position is shared by Ermolenko A., Naumov S., who argue about the need to develop characteristics that “allow us to assess the advance or lag of specific places in the economic space in accordance with the requirements of the new reality for the main complexes of its problems:

- State of the natural environment.
- Polarization in the territorial community.
- Reproduction of the subject potential of the economy” (Ermolenko A., Naumov S.)<sup>[4]</sup>.

We proceed from the dichotomy: “state interest - national security - economy - quantitative indicators” / “public interest - level of material and social comfort - quality of life - quantitative and qualitative indicators.”

**Results and Discussion**

The dynamism of scaling human capital as the “acquired” capital of the region against the backdrop of “natural” capital (natural resources, fixed assets, etc.) as a way of leveling the “core” of contradictions in government regulation can be systematically implemented by prioritizing institutional components - health and natural environment.

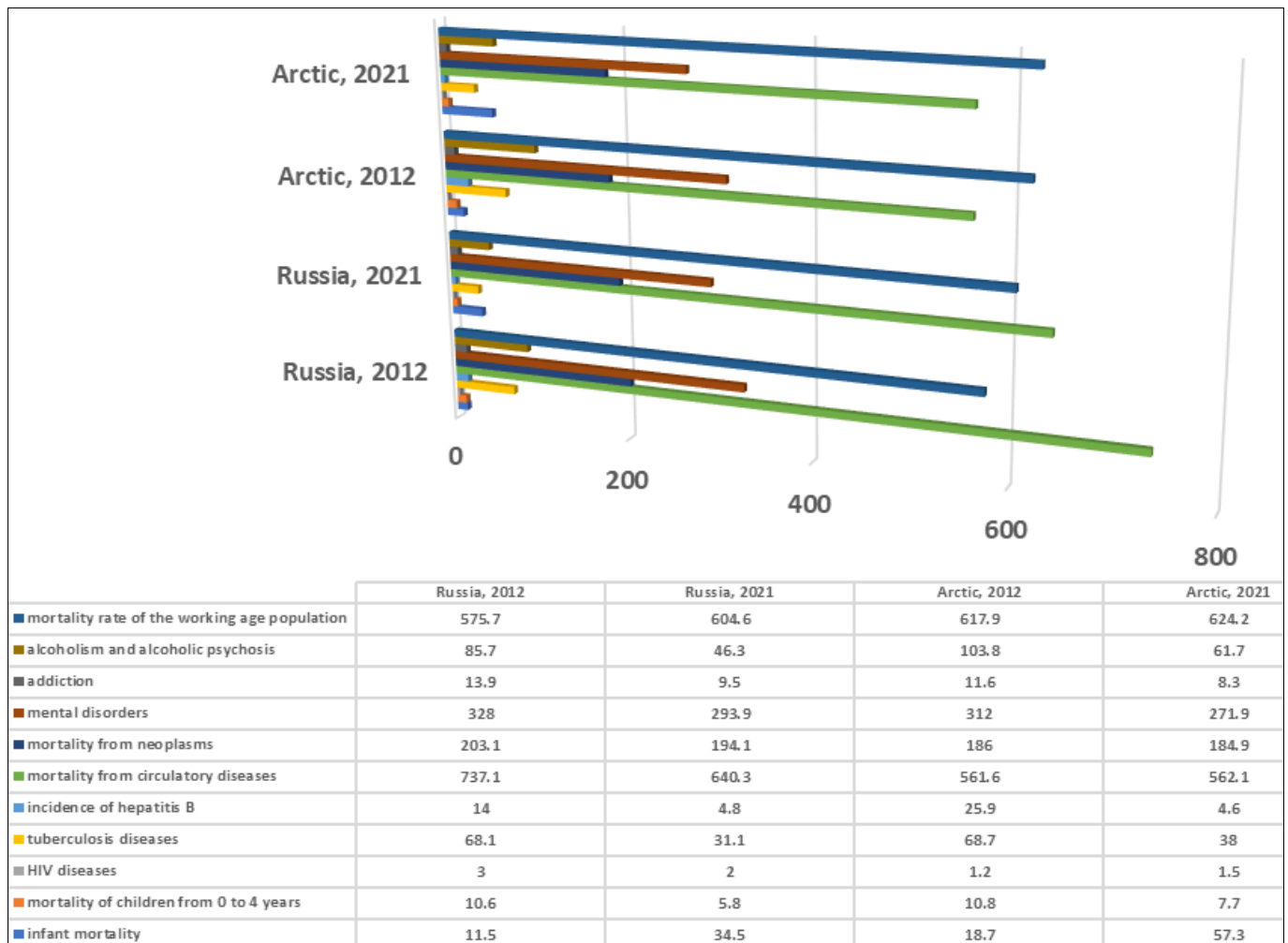
Health capital corresponds to the strategic and tactical focus of the state obtaining an economic effect and ensuring the

expanded reproduction of human capital.

The average statistical characteristics of health capital in the constituent entities of the Russian Federation classified as the Arctic zone are presented in Fig. 1.

Based on research by the Harvard Center for Health and Human Rights (FXB), in the long term, maternal mortality rates in the Russian Arctic indicate an increase in household financial instability, a decrease in the level of education, an increase in the mortality rate among children and, in general, a decrease in the quantitative and qualitative characteristics of the gene pool.

The mortality rate of children under 4 years of age is a fairly “subtle” indicator of the socio-economic well-being of territories, indicating an increase in the volume of innovative medical programs used to detect diseases in the early stages, and an increase in the equipment of medical organizations. The only Arctic region for 2012-2021 that showed an almost 2-fold increase in the mortality rate of children under 4 years of age is the Nenets Autonomous Okrug. In general, this indicator for the Arctic regions is higher than the Russian average, which indicates an evolutionary-progressive regulation of the sphere of reproduction of human capital without taking into account the time lag in obtaining the results of management decisions.



**Fig 1:** Health capital indicators of the Russian Arctic

The annual loss of national GDP associated with a reduction in the workforce due to HIV incidence is estimated at 0.1%. The high mortality rate among those infected with HIV

gives rise to a high mortality rate in working age, since, according to ILO estimates, 80% of the population with HIV belongs to the economically active group in the labor

market (15-49 years). 100 thousand annual new cases of HIV lead to 40-80 thousand additional deaths per year (On the state, 2022) <sup>[9]</sup>. The process of diagnosing and making management decisions in terms of leveling the problem of the spread of HIV infection has a high level of inertia - 2-3 years, which indicates the insufficient effectiveness of the state health policy in terms of preventive measures for the incidence of HIV in the Arctic region.

In 2021, the incidence of tuberculosis and mortality from tuberculosis were higher than the Russian average in the Chukotka Autonomous Okrug and the Krasnoyarsk Territory. Although the indicator has decreased by 1.8 times, it is still higher than the average value, which in the future will lead to an increase in the risks of deterioration in sanitary conditions, social discrimination and marginalization as disincentives for the reproduction of social capital that is a high priority for the Arctic region.

The decrease in the incidence of hepatitis in the Arctic region indicates the effectiveness of immunoprophylaxis (with the exception of the Yamalo-Nenets Autonomous Okrug and the Republic of Sakha (Yakutia)) and measures to prevent the progression of the disease.

Mortality rate from diseases of the circulatory system in the Arctic region for 2012-2021. has not changed fundamentally and continues to remain below the Russian average level (with the exception of the Republic of Karelia, the Arkhangelsk region, the Murmansk region and the Krasnoyarsk Territory), which can also be considered as a manifestation of the evolutionary-progressive orientation of the regulation of socio-economic relations. However, strategically, this mortality factor will continue to destabilize the situation in the labor market of the Arctic region, primarily by reducing the time and scope of stay in the working period.

The dynamics of the mortality rate from neoplasms in the Arctic zone shows minor improvements in the functioning of the diagnostic system and earlier detection of diseases. At the same time, in the Republic of Karelia, the Komi Republic, the Nenets Autonomous Okrug, the Arkhangelsk Region, the Krasnoyarsk Territory and the Republic of Sakha (Yakutia) the mortality rate from neoplasms is higher than the Russian average.

The decrease in the rate of mental disorders and its lower value in the Arctic region compared to the Russian average can be considered not only as a positive result of health policy, but also the preservation of the "core" of social capital of the northern territories, reduction of indirect losses of GDP and GRP due to a decrease in the level of mental disorders. To preserve the "core" of the reproduction of social capital, it is necessary to intensify government intervention in the prevention of mental illness and the elimination of external stimuli at an early, school and student age.

The level of drug addiction in the Komi Republic, Krasnoyarsk Territory, and Yamalo-Nenets Autonomous Okrug is higher than the Russian average. In addition to the obvious harm to health, drug addiction leads to a reduction in the amount of social capital, an increase in government spending on preventing and eliminating the consequences of antisocial behavior of drug addicts, while reducing tax revenues due to decreased ability to work. A departure from the evolutionary-progressive regulation of the reproduction of human capital will allow the formation of "drug immunity" of the Arctic regions, primarily as a system of

social and institutional sanctions measures. The prioritization of the socio-institutional component in reducing the scale of drug addiction in the Arctic region is also due to the fact that a correlation has not been identified between the level of drug addiction and the rate of natural population growth (see Table 1).

The Arctic region is characterized by a decrease in the level of alcoholization of the population, as well as the Russian Federation as a whole. However, the level of alcoholism continues to remain above the Russian average. Thus, mortality due to alcohol poisoning is higher than the all-Russian indicator in the Komi Republic (men 2.2 times, women 3 times), Arkhangelsk Region (men 2 times), Chukotka Autonomous Okrug (women 2.7 times) (Revich B., Kharkova T., Kvasha E., 2023) <sup>[11]</sup>. However, the decrease in alcoholization rates is not associated with an increase in healthcare costs and an increase in its efficiency, since "the incidence of alcoholism is adjusted with the unemployment rate, poverty level, human development index, Gini coefficient" (Azarov T., Vladimirov I., Petrovskaya I., 2022) <sup>[12]</sup>. Continuation of the evolutionary-progressive nature of regulation of the reproduction of human capital in the Arctic region will lead to a decrease in the length of stay of the population in the working period, an increase in the objectively ineffective load on the healthcare system due to the comorbidity of patients suffering from alcoholism, as well as deformation of the system of perception of public values.

The Arctic region is characterized by an increase in the mortality rate in working age. The mortality rate in working age in the Republics of Komi and Karelia, the Arkhangelsk and Murmansk regions, the Chukotka Autonomous Okrug, and the Krasnoyarsk Territory is higher than the Russian average. Correlation and regression analysis confirms the existence of a connection between the mortality rate of the working-age population and working conditions (Kozlova O., Makarova M., Tukhtarova E., Belenkova T., 2015) <sup>[5]</sup>. Accordingly, the activation of state policy on labor protection and the prevention of occupational diseases should be considered as a necessary condition for preventing demographic destabilization of the Arctic region. Basic content analysis of data on the reproduction of health capital of territories made it possible to identify relatively prosperous regions of the Russian Arctic (Komi Republic, Republic of Karelia, Murmansk region) and regions that need priority state regulation of socio-economic processes (Nenets and Chukotka Autonomous Okrug, Yamalo-Nenets Autonomous Okrug, Republic of Sakha (Yakutia), Arkhangelsk region, Krasnoyarsk region).

Synthetic indicators of the level of health capital are determined, among other things, by indicators of the use of natural resources and environmental consequences. So, in the 1970s. The World Health Organization found that the health status of mixed populations depended on environmental indicators by 20%. Russian researchers concluded that 43-45% of the deterioration in public health is associated with air pollution (Stepanovskikh A., 2001) <sup>[13]</sup>. Atmospheric pollution is responsible for about 20-30% of common diseases in the population of industrial centers against the background of variability in the "classical" forms of pathology of already known diseases (Abushinova D., Razumnaya S., Taran K, 2016) <sup>[1]</sup>. The environment also creates negative impact factors associated with disturbances in light, electromagnetic, acoustic or vibration conditions,

which is especially typical for the Arctic region.

Negative environmental factors that increase the contradictions in the reproduction of human capital include the following:

1. An increase in ambient temperature, which leads to flooding, a reduction in the bearing capacity of permafrost and an increase in man-made accidents. An increase in average annual temperature has been observed in the Arctic region since the 1970s. And has accelerated sharply since the early 2000s. Warming for 1976-2021 in general it is 0.69 °C/10 years (On the state, 2022) <sup>[9]</sup>.
2. Average estimate of total damage as a result of permafrost degradation by the middle of the 21st century. Will amount to 105.07 billion dollars, the largest share is contributed by the Yamalo-Nenets Autonomous Okrug (52.33 billion dollars). 32% of the entire Arctic infrastructure, the cost of which is estimated at 40.339 billion dollars, will be subject to destructive effects. (Anisimov O., Badina S., Belolutskaia M., 2023) <sup>[3]</sup>.
3. Mothballed military and civilian facilities, waste from Arctic development. Thus, in the zone of specially protected natural areas of the Arctic region, waste on 40 thousand hectares is subject to disposal, which will require about 3 billion rubles. Funds from the state budget to correct the environmental situation.
4. The average Russian value of the volume of recycled waste in 2021 was 46.6%, the average annual value in the administrative-territorial formations of the Arctic region was 36.7%. The smallest volumes of waste disposal in 2021 were in the Arkhangelsk region (1.26%), the Republics of Komi (5.14%) and Karelia (6.68%).
5. "Stressful" climatic factors, as a result of which the development of the immune system of children in the Arctic region lags and the gene pool deteriorates. "Children of the North are in unequal starting conditions of life compared to children in other regions of the country and get sick 2.5 times more often" (Nikolaev M., 2009) <sup>[8]</sup>. According to the results of sociological surveys, 45% of the population of the Russian Arctic would not want their children to live and work in the Arctic territories (Skufiina T., Samarina V., 2021) <sup>[12]</sup>.
6. Lack of access to quality digital services. In 90% of the Arctic region there is no broadband access to the Internet.
7. Urbanization: about 90% of the Arctic region is urban. Urbanization processes multiply the negative impact on the environment, stimulating the need to increase the volume of budget expenditures to ensure a comfortable urban environment and preserve (and/or replenish) natural resources.
8. Low quality of drinking water and wastewater treatment: up to 70% of administrative territories need measures to ensure sanitary and hygienic standards for drinking water supply (Ridiger A., 2023) <sup>[10]</sup>. In all regions of the Russian Arctic in 2007-2020. Excesses of hygienic standards were recorded for such indicators as iron, aluminum, nickel, manganese, coliphages, common colimorphic bacteria, thermotolerant colimorphic bacteria (Kopytenkova O., 2023) <sup>[6]</sup>.
9. Significant disruption of ecosystems and biobalance of

territories associated with the functioning of enterprises in the mining and manufacturing industries. As of December 31, 2021, the development of mineral deposits accounted for more than 73% of the total volume of disturbed lands (On the state, 2022) <sup>[9]</sup>. Damage to soil cover and erosion stimulate biological depletion, changes in the food supply, a reduction in the volume of agricultural land used, and disruption of the habitat of indigenous small peoples.

10. An increase in the coefficient of anomalousness of the atmosphere, which leads to the emergence of "disaster zones" in certain territories of the Arctic region (Kola Peninsula, Murmansk region, Norilsk) and, as a consequence, an increase in the number of threats to public health (increase in cancer, blood diseases, etc.). The boundaries of "disaster zones" can also extend to territories bordering the Arctic zone, since atmospheric pollution in the form of dust is deposited on the surface at a distance of up to 7 km from the source of the release; pollutants in the form of aerosols and gases spread over an area of up to 400 km (Okunich A., Burenina T., 2014) <sup>[8]</sup>.

The Arctic zone is characterized by excess concentrations of suspended substances in the atmosphere (a factor stimulating the increase in the number of diseases of the respiratory system and cardiovascular system), sulfur dioxide (respiratory diseases), and carbon oxide (brain and myocardial hypoxia). In 2021, of the 64 pollutants released into the atmosphere of the Russian Arctic, the top five were methane (54.1%), carbon (9.6%), silicon oxide (7.5%), hexane (4.9%), sulfuric acid (1.3%).

Mortality from respiratory diseases in 2000-2021. Higher than in Russia as a whole, was noted in the Chukotka Autonomous Okrug (1.6 times in men and 2.8 times in women), as well as in men in the Komi Republic and women in the Yamalo-Nenets Autonomous Okrug (1.6 times). 2 times) (Revich B., 2023) <sup>[11]</sup>. At the end of 2021, the Yamalo-Nenets Autonomous Okrug registered an increase in congenital anomalies and malformations by 38.9%, diseases of the endocrine system by 25.1%, diseases of the blood and hematopoietic organs by 24.5%.

The unfavorable environmental situation as an anti-stimulating component of the reproduction of human capital is also confirmed by the fact that the coefficient of natural population growth in the Arctic territories in 2015 was 3.9, and in 2021 - minus 3.6; migration growth rate in 2015-2021. Remained negative (with the exception of 2021-Yamalo-Nenets, Nenets and Chukotka districts). In this case, resolving regulatory contradictions lies not only in the area of effective environmental policy, but also within the framework of territorial accessibility for the population of the Arctic region of high-quality specialized medical care. We emphasize that the issue is relevant specifically in terms of the quality of medical care, because the calculated correlation, in particular, between the natural increase rate and the number of treatment and preventive institutions is negative (Table 1).

Replenishment of human capital can also be implemented within the framework of national migration policy. However, the regulation of migration processes since 1992 has become a negative fluctuation both for the implementation of state interests in the Arctic and for the interests of the reproduction of human capital.

Interregional migration is of predominant importance for the Arctic territories, accounting for 86.3% of the decline (Fizer V., Smirnov A., 2020) [14]. The maximum contribution was made by the Murmansk region, the Komi Republic, and the Arkhangelsk region. The population decline in Vorkuta and Norilsk is 2.5 times higher than in conditionally unfavorable

zones (Arkhangelsk, Severodvinsk). In 2019-2021 According to the calculations, migration dynamics were characterized by a perfect connection ( $r = 1$ ) with indicators of waste disposal and the release of pollutants into the atmosphere (Table 1).

**Table 1:** Correlation analysis of socio-economic indicators of the Russian Arctic

Index	2019	2020	2021	Correlation coefficient	Index
Migration growth rate	-3, 8	-3, 0	-1, 0	1,0	-
-	3284, 6	3386, 1	3337, 7		Pollutants released into the atmosphere, thousand tons
-	0, 0275	0, 025	0, 029	1,0	Waste neutralized, %
Rate of natural increase	0, 7	-1, 0	-3, 6	0,0	-
-	9, 97	6, 69	8, 3		Established diagnosis of drug addiction
-	448	465	508	-1,0	Number of hospitals
Maternal mortality ratio	13	14,5	57, 4	1,0	-
-	448	465	508		Number of hospitals

The optimal period of residence for “interregional migrants” in the Arctic region is 1-2 years (Fizer V., Smirnov A., 2020) [14]. At the same time, the share of the permanent population of the Arctic zone aged 15-49 decreased from 7.57% in 2012 to 6.87% in 2017. It can also be said that the material component of human capital reproduction is not a priority for choosing a location residence: at the end of 2021, the Russian Arctic is characterized by less differentiation of the population by income level than the Russian average (8.3 and 15.2, respectively).

### Conclusion

An unfavorable environmental situation as one of the results of the evolutionary-progressive nature of regulating the reproduction of health capital is not only a basic factor in the negative reproduction of human capital in the Arctic region, but also a strategic factor in reducing the efficiency and increasing the payback of high-cost Arctic projects.

Resolution of the contradictions in regulating the reproduction of human capital in the Arctic region can be realized within the framework of the transition from the evolutionary-progressive dynamics of state regulation to the dynamics of a “leap”, i.e. from smoothing out negative fluctuations in the field of healthcare, migration, ecology, and the use of mineral resources to streamlining the system of reproduction of human capital, resolving contradictions between the function and goal of ensuring the quality of life in the Russian Arctic.

The distortion of the mechanism for regulating the reproduction of human capital in the Arctic regions is aggravated by the modern geopolitical situation, which is clearly not oriented towards compliance with complex social and environmental patterns and delayed effects. A possible solution may be to move to a “soft management” model with an emphasis on “leadership and effective use of communications.” The role of “leader” should be taken on by large mining and processing enterprises or their industry associations.

### References

1. Abushinova DV, Razumnaya SE, Taran KP. The influence of the state of ecology on human health. Bulletin of Medical Internet Conferences. 2016;6(5):671-676.
2. Azarov TA, Vladimirov IV, Petrovskaya IA. The relationship between socio-economic indicators, the incidence of alcoholism and alcoholic psychosis in Russia, 1992-2020. *Juvenis Scientia*. 2022;8(6):30-40.
3. Anisimov O, Badina S, Belolutskaya M, *et al*. Climate change in the Russian Arctic: risks and new opportunities. Federal State Budgetary Institution. State Hydrological Institute, Moscow, 2023, 105.
4. Ermolenko AA, Naumov SV. Transforming the way of relationship between social production and consumption: imperatives of the new reality. *Spatial economics*. 2021;17(1):163-189.
5. Kozlova OA, Makarova MN, Tukhtarova EKH, Belenkova TV. Working conditions as a factor influencing mortality rates of the population of working age. *Basic research*. 2015;7-1:161-165.
6. Kopytenkova OI. Quality of drinking water from centralized drinking and domestic water supply systems in the Russian Arctic. URL: <https://fcrisk.ru/forums/node/1362>.
7. Nikolaev ME. Arctic challenges. Publishing house of the Federation Council of the Federal Assembly, Moscow, 2009, 303.
8. Okunich AA, Burenina TA, Zubareva ON. Others. Pollution of snow cover in the zone of influence of enterprises of the Norilsk industrial region. *Siberian ecological Journal*. 2014;6:1025-1037.
9. On the state and protection of the environment of the Russian Federation in 2021. State report. Ministry of Natural Resources of Russia; Moscow State University named after M.V. Lomonosov, Moscow, 2022, 684.
10. Ridiger A. Arctic urbanization should be linked to the solution of environmental problems. URL: <https://goarctic.ru/society/anna-ridiger-arkticheskaya-urbanizatsiya-dolzha-byt-uvyazana-s-resheniem-ekologicheskikh-problem/>
11. Revich BA, Kharkova TL, Kvasha EA. Dynamics, structure and characteristics of mortality among the working-age population of the Arctic macroregion. *Health risk analysis*. 2023;1:13-26.
12. Skufina TP, Bazhutova EA. Pension reform of 2018 in Russia and its impact on employees of the city-forming enterprise in the Russian Arctic. *Economy. Computer science*. 2021;3:434-445.
13. Stepanovskikh A.S. Ecology. UNITY-DANA, Moscow, 2001, 703.
14. Faizer VV, Smirnov AV. Migration of the population of the Russian Arctic: models, routes, results. *Arctic: ecology and economics*. 2020;4(40):4-15.
15. Reshetnikov AV. Economics and management in health care. Yurayt, Moscow; c2023.